



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,718	12/10/2001	Mitsuhiro Okuni	740819-711	3646

22204 7590 04/23/2003

NIXON PEABODY, LLP  
8180 GREENSBORO DRIVE  
SUITE 800  
MCLEAN, VA 22102

EXAMINER
----------

VINH, LAN

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 04/23/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/006,718

Applicant(s)

OKUNI, MITSUHIRO

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☒ Certified copies of the priority documents have been received in Application No. 10006718.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (US 5,801,101) in view of Kumihashi et al (US 5,368,685)

Miyoshi discloses a method for forming metal wiring by dry etching an aluminum-silicon copper alloy film in the plasma chamber using an etching gas mixture mainly comprises a chlorine gas (col 5, lines 25-28). Miyoshi also discloses that  $t = pV/Q$  wherein  $t$  is the residence time of the gas in the chamber/gas stay time,  $p$ : the pressure in the chamber (Torr),  $V$ : chamber volume (l),  $Q$ : exhaustion amount (Torr.l/sec)/total etching gas flow (col 3, lines 15-25)

Unlike the instant claimed inventions as per claims 1, 6, Miyoshi does not disclose the specific values of the gas stay time/ the residence time of the gas in the chamber and the pressure in the chamber although Miyoshi discloses that the residence time of the gas/gas stay time can be changed by changing/adjusting the pressure in the chamber and the exhaustion amount/total etching gas flow (col 3, lines 32-35 )

However, Kumihashi, in a method of dry etching, teaches changing the volume of the etching chamber and volume of the discharge/exhaust part to obtain a specific gas residence time (col 13, lines 11-15)

Hence, one skilled in the art would have found it obvious to change/adjust Miyoshi's chamber pressure and the exhaustion amount/total flow rate by conducting routine experimentations to obtain the specific value of the gas stay time because Kumihashi serves as evidence that the gas stay time/ the residence time of the gas is a result variable. It has been held that the discovery of an optimum value for result effective variables is within the purview of routine experimentation by the person of ordinary skill in the art. In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980)

3. Claims 2, 4, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (US 5,801,101) in view of Kumihashi et al (US 5,368,685) and further in view of Nowak et al (US 6,220,201)

Miyoshi as modified by Kumihashi has been discussed above in paragraph 2. Unlike the instant claimed inventions as per claims 2, 4, 7, 9, Miyoshi and Kumihashi do not disclose the specific values of the wafer diameter and the chamber volume.

However, Nowak, in a method of high density plasma etching, teaches that the volume of the chamber changes depending on the size of the wafer (col 7, lines 23-25)

Thus, Novak serves as evidence that volume of the chamber and size/diameter of the wafer are result variable. It has been held that the discovery of an optimum value for result effective variables is within the purview of routine experimentation by the person of ordinary skill in the art. In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980)

Art Unit: 1765

4. Claims 3, 5, 8, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (US 5,801,101) in view of Kumihashi et al (US 5,368,685) and further in view of Nowak et al (US 6,220,201) and Hyncek (US 4,708,766)

Miyoshi as modified by Kumihashi and Novak has been discussed above in paragraph 3. Unlike the instant claimed inventions as per claims 3, 5, 8, 10, Miyoshi, Kumihashi and Novak do not disclose the specific values of the total etching gas flow rate.

However, Hyncek, in a method of dry etching, teaches that the gas flow rate should be adjusted proportionally when the volume of the chamber changes (col 5, lines 26-29)

Hence, one skilled in the art would have found it obvious to change/adjust Miyoshi, Kumihashi and Novak chamber pressure by conducting routine experimentations to obtain the specific flow rate values because Hyncek serves as evidence that the gas flow rate is a result variable. It has been held that the discovery of an optimum value for result effective variables is within the purview of routine experimentation by the person of ordinary skill in the art. In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980)

Art Unit: 1765

***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV  
April 10, 2003